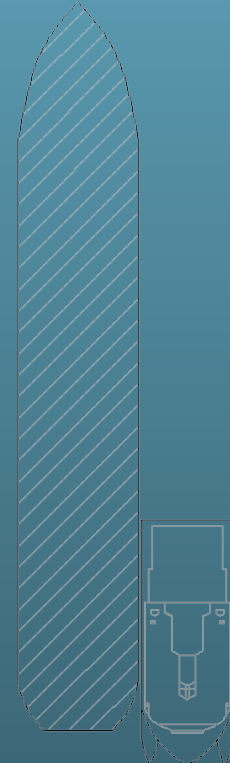
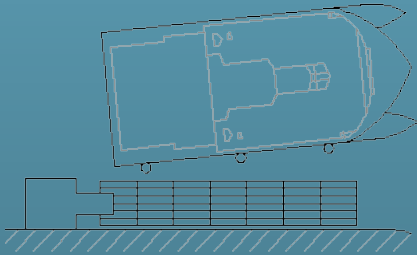




DEPLOYABLE AIRBEAM FENDER SYSTEM (DAFS)



**Joint Sea Basing Theater Access Workshop
9 February 2005**

Claudia Quigley & Karen Santee





DFAS Agenda

- DAFS Objective
- Process
- Solution
- Sizing the Fender
- Preliminary Prototype Design
- Modeling
- Testing





DFAS Objective

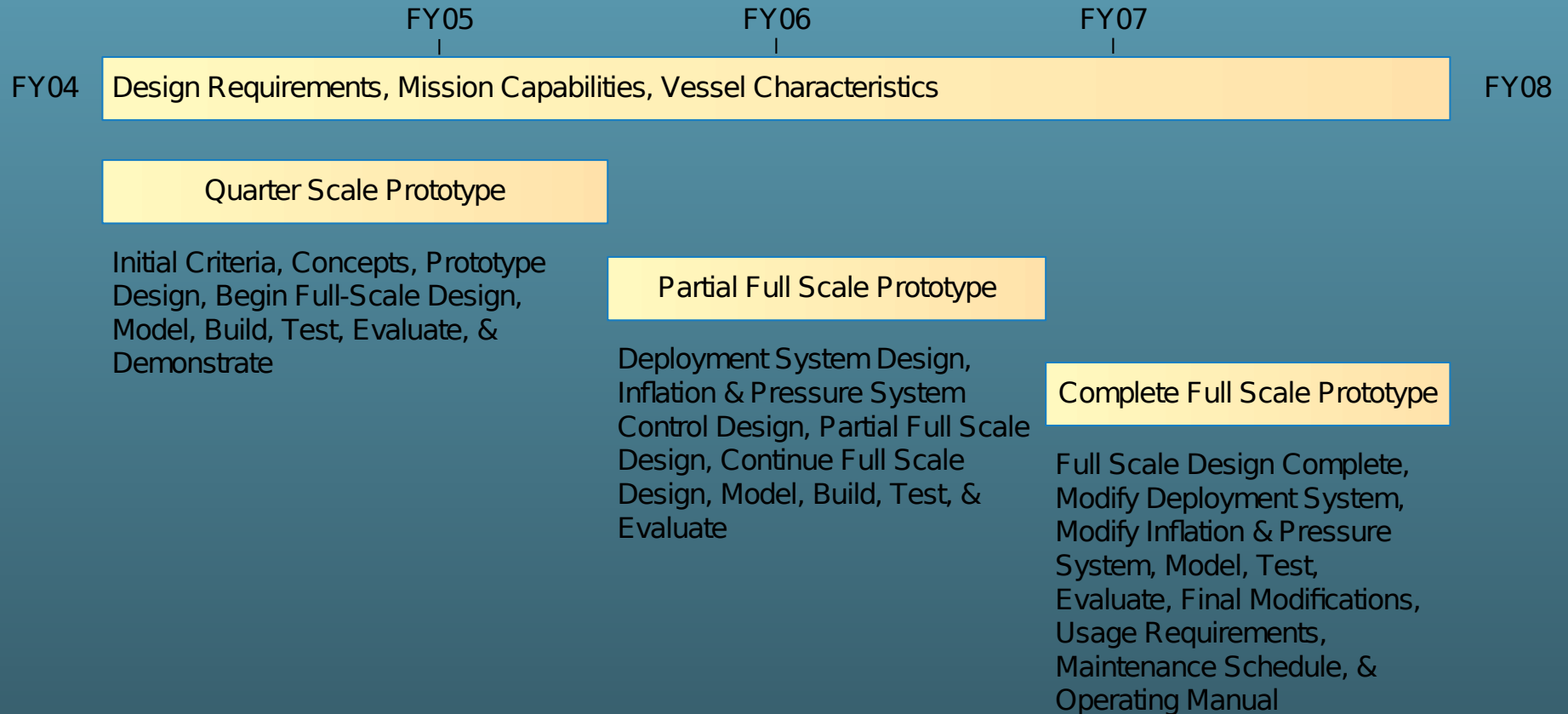


The fender system shall:

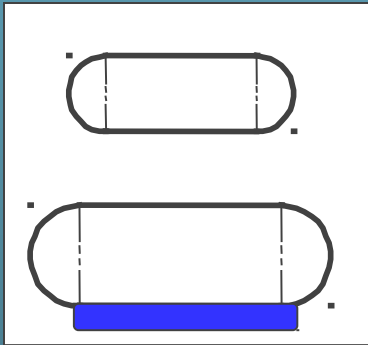
- Protect the Hull
- Act as a separator
- Self deploy & retract
- Possess redundancy
- Be organic to the ship
- Be lightweight
- Have an operational threshold of Sea State 2, objective of Sea State 3



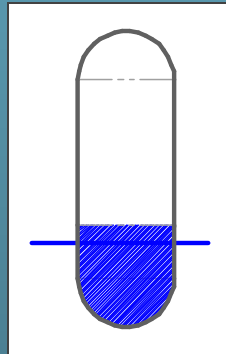
Process Plan



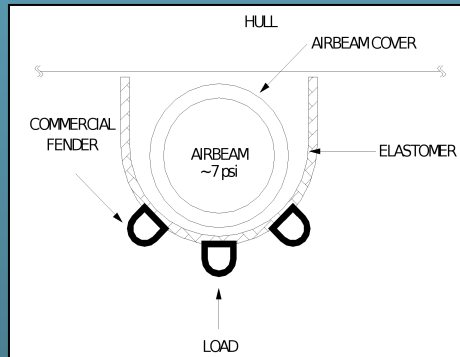
Early Concepts



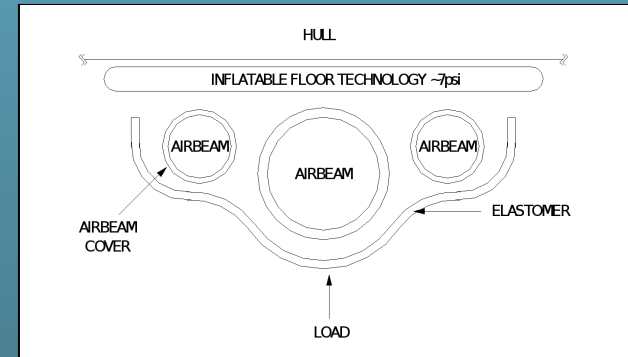
Dual Horizontal Airbeams



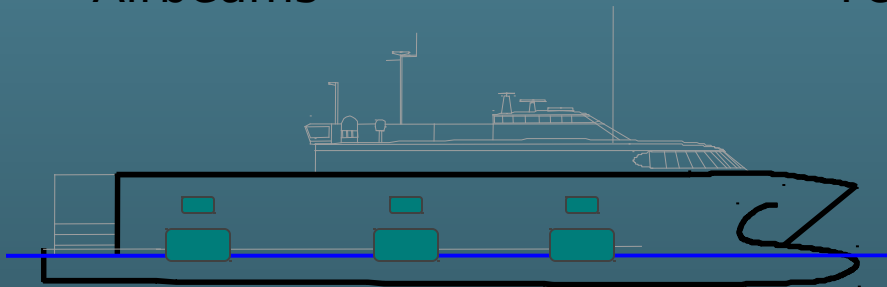
Vertical Airbeam



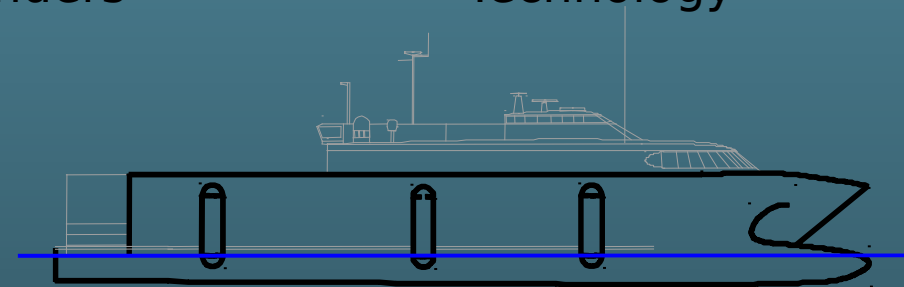
Vertical Airbeam with Commercial Fenders



Vertical Airbeams with Inflatable Floor Technology



Horizontal Fender System



Vertical Fender System



Concept Tests



Commercial
Inflatable Fender



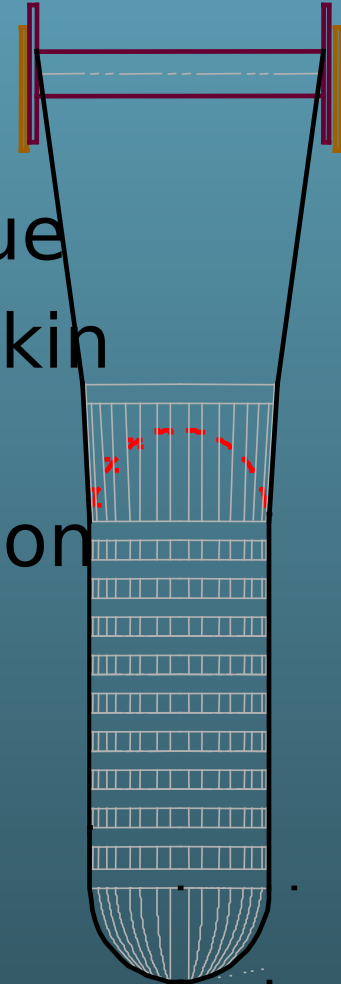
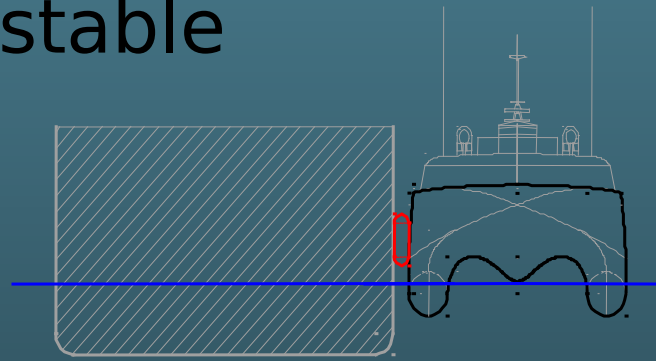
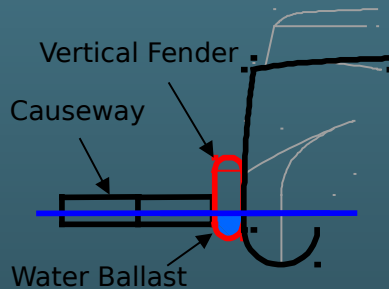
Multiple
Pressured
Airbeams



Varied Pressure

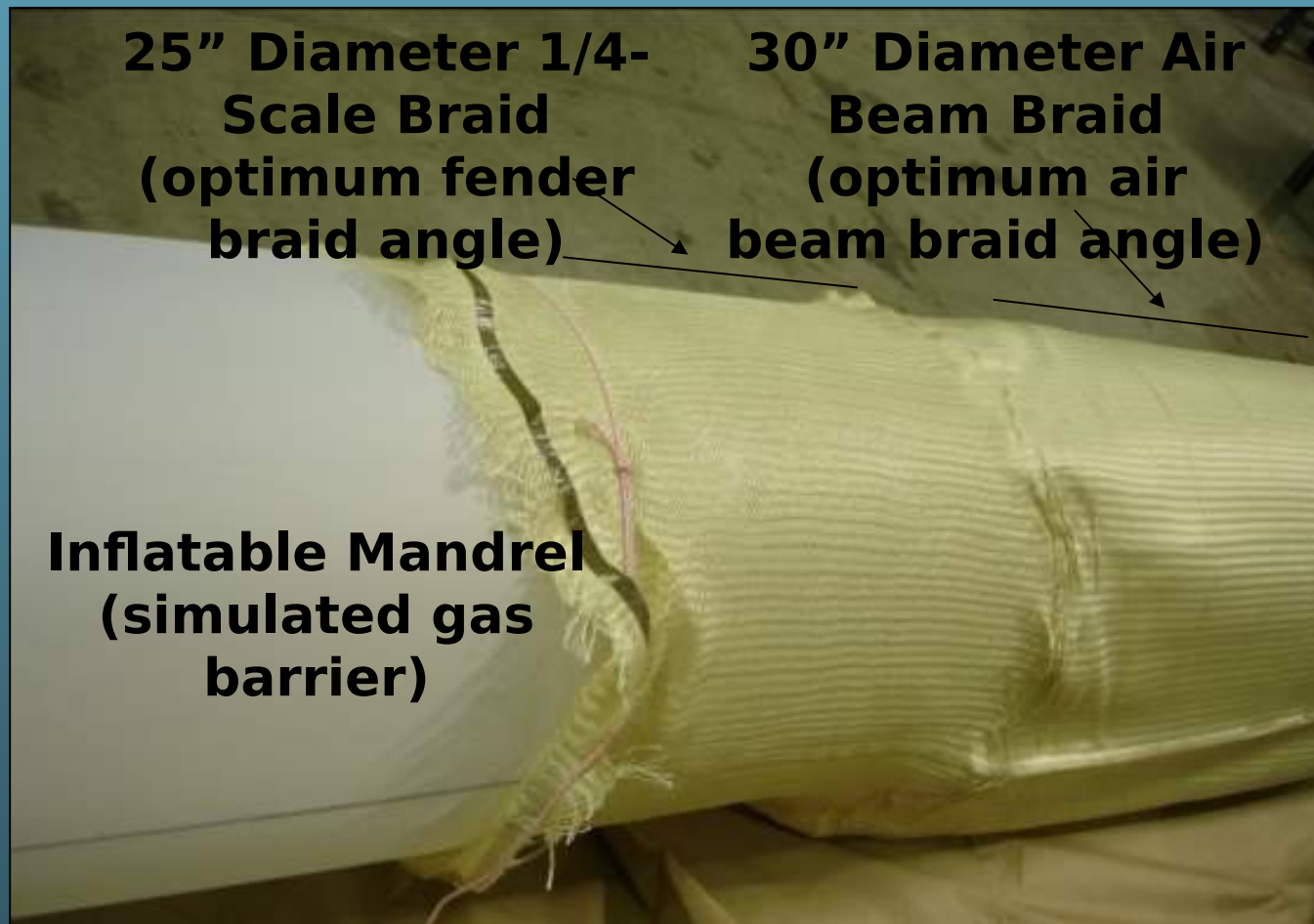
Selected Concept

- Vertically Oriented Fender
 - Solves causeway override issue
 - Minimizes roll during skin-to-skin operations
 - Ease of deployment & retraction
 - Height Adjustable





Preliminary Manufacturing





Concept Animation





Optimum Fender Size

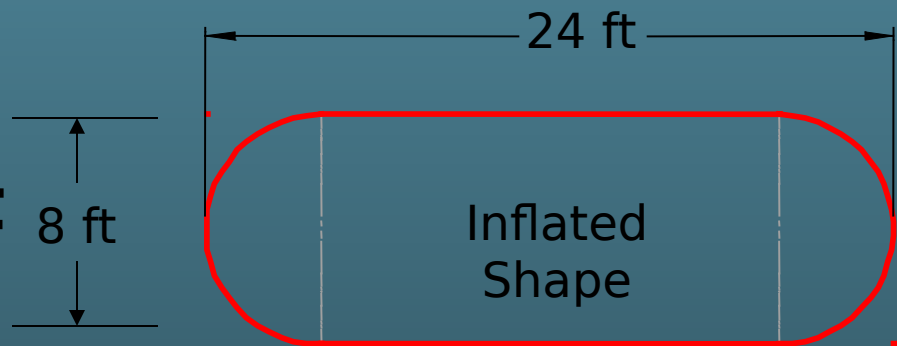
Fender Dimensions Based on:

- Making the fenders as unobtrusive as possible
- Size based on realistic design parameters
- Ship-to-causeway design

Optimum size:

Diameter = 8 feet

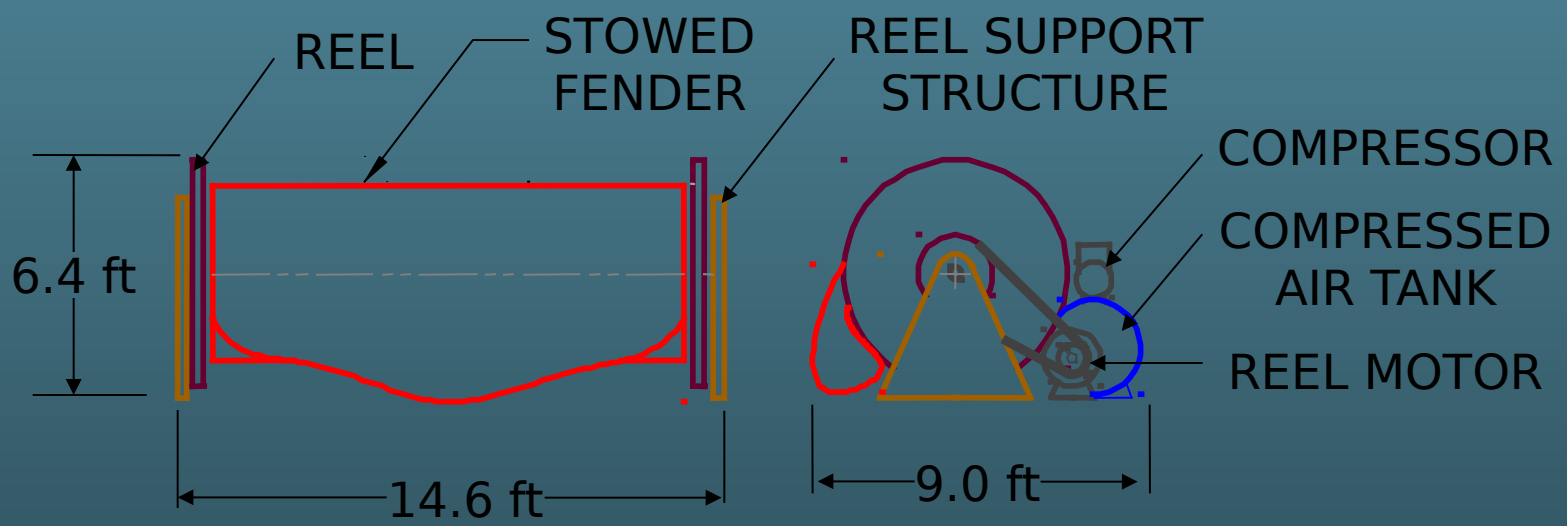
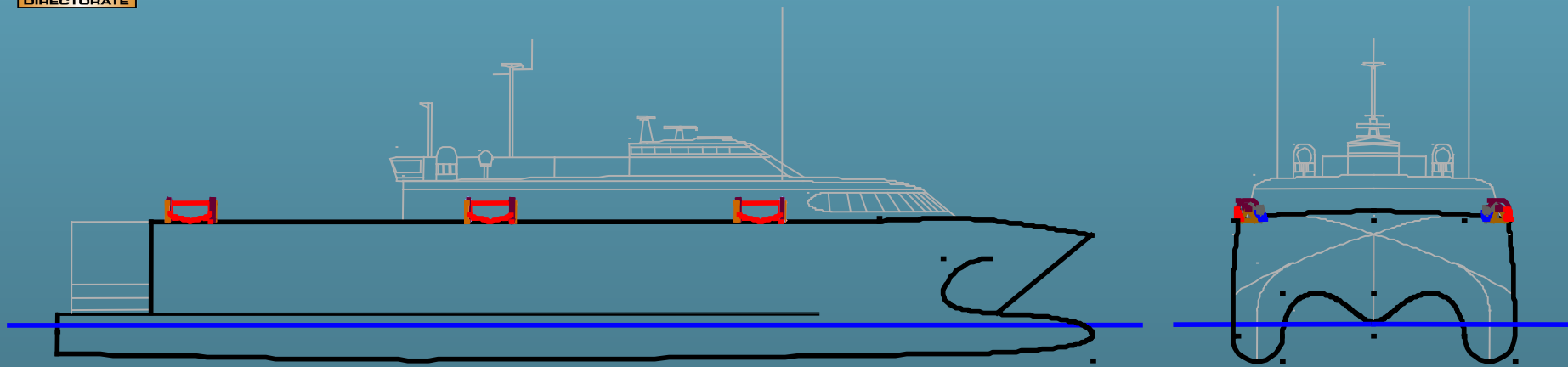
Length = 24 feet





Full Scale Stowed Fender

Approximate Size Relative to HSV





Testing

Laboratory Test of 10" Diameter Airbeam





Model & Analysis

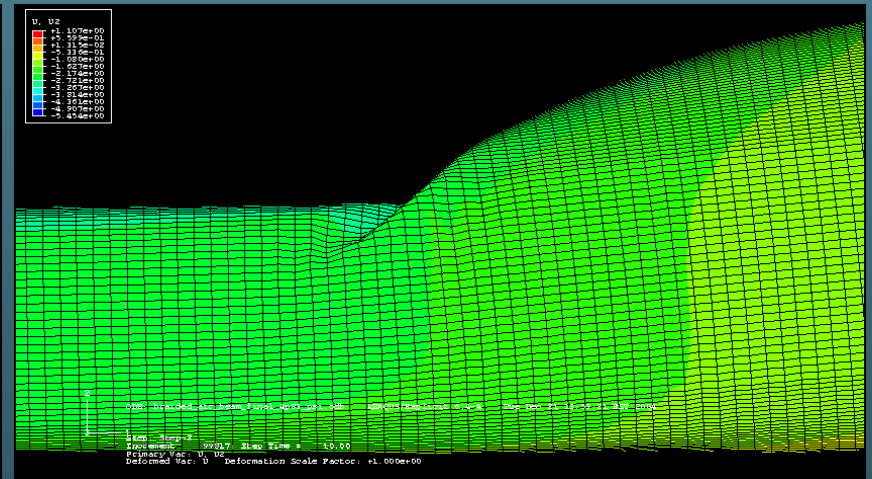
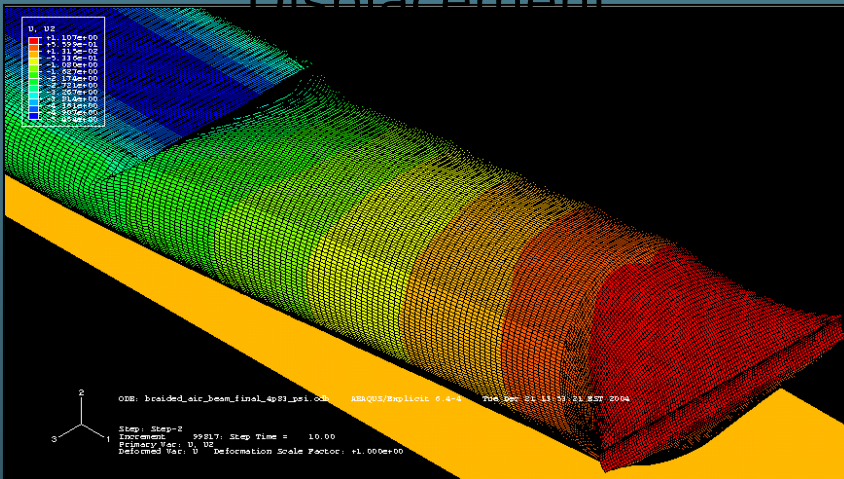
Deformed Model of 10" Diameter Airbeam

Side View Shown At 5.45" displacement



Top View of Vertical Displacement

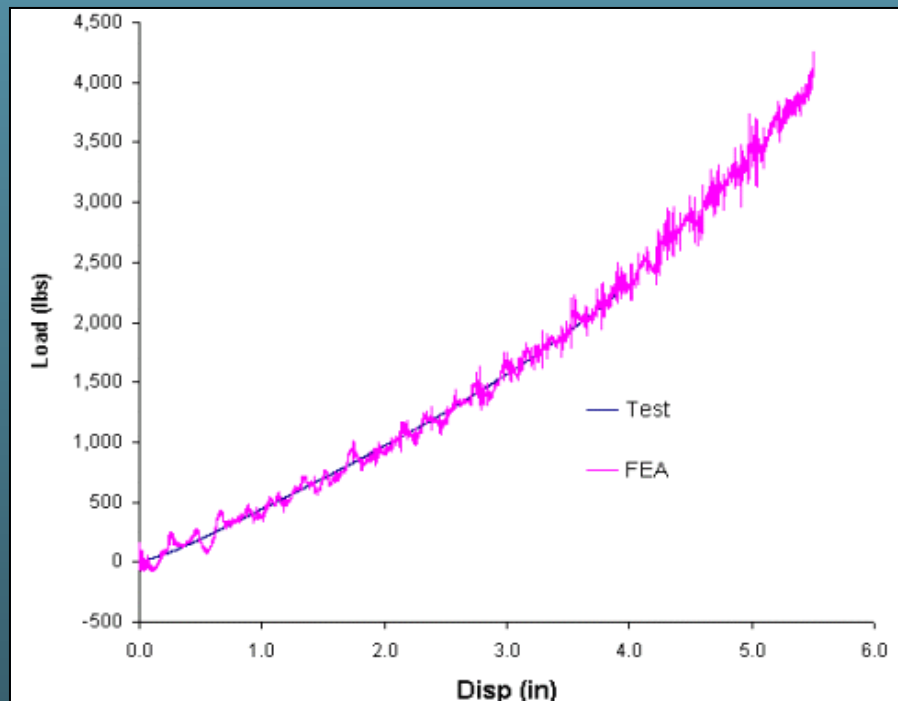
Side View of Pinch Point



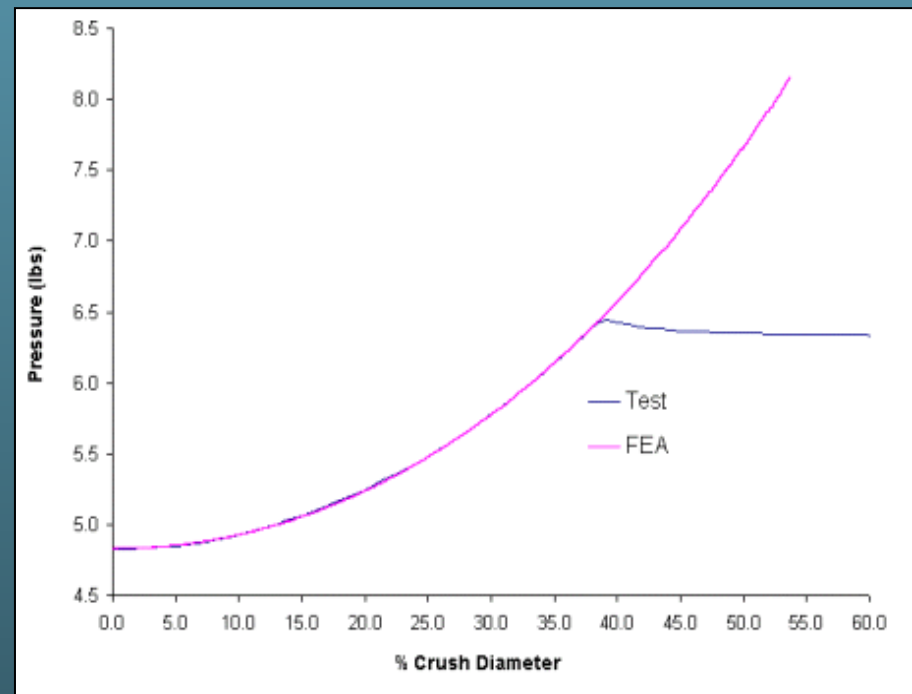


Correlation of Model & Testing

Load vs. Displacement



Inflation Pressure vs. Percent Diameter Crush





Next....



- Complete Prototype: Build, Test, & Evaluation
- Complete Partial Full Scale & Full Scale: Design, Build, Test, & Evaluation
- Plan for Sea Trials

10" Diameter Fender with
Hemispherical Ends